Cloud Assignment I

Flow Visualization

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The purpose of the cloud assignment is to take pictures of phenomena related to clouds in the atmosphere. There are many different kinds of the cloud phenomena depending on the different atmosphere conditions on the Earth.

This image was taken on Saturday, September 1st at approximately 19:25 during sunset, faceing southeast. I took many pictures of the different kinds of the clouds during one month. This one is my best one I choose. I saw this cumulous cloud when I went to Lyons Colorado to visit my friend. This cloud looks like altocumulus based on the cloud classifications. Altocumulus clouds often form in front of a cold front as unstable atmosphere is lifted and were typically observed at mid-levels between 6,500 to 20,000 feet (2,000 to 6,000 meters). The colors of the altocumulus clouds look a little red, induced by reflecting of the sun during the sunset.

Image details

Location: Lyons, Colorado

Date: Saturday 9/01/2007

Time: 19:25 pm

Direction: Southeast

Temperature: Hi: 87F/31C, Lo: 66F/19C

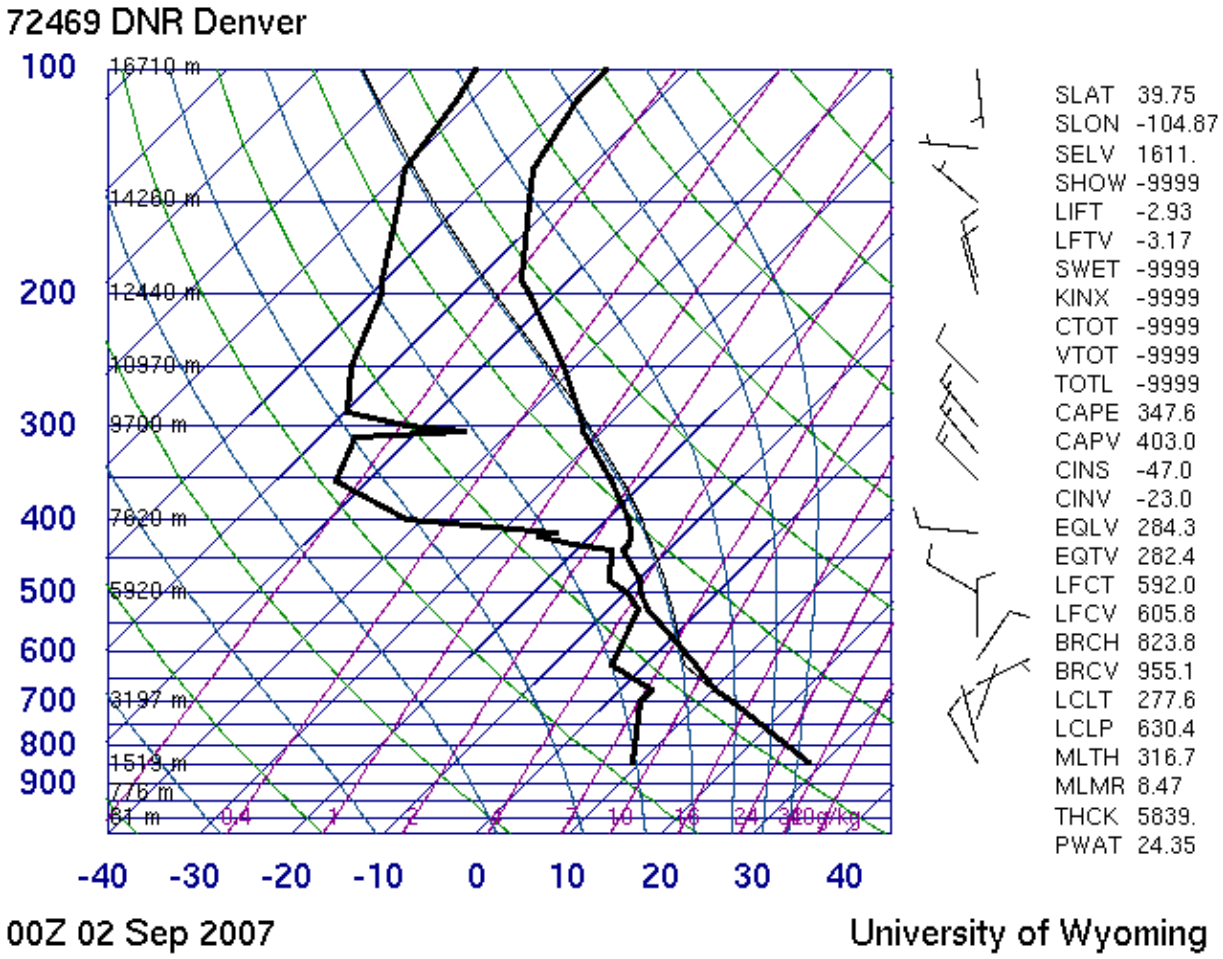
Altitude: 5375'/1638.3 meters

Pixel Dimension: X: 3888; Y: 2592

Figure 2 is a Skew-T plot of the sounding data from September 2nd and downloads from the website of the University of Wyoming. I captured the picture at 19:25 pm on September 1st and the date of the Skew-T plot shows up at 00:00 on September 2nd,

but its time has to minus 7 to be Mountain Time zone because the time of the Skew-T plot is based on the **Coordinated Universal Time** (UTC). Therefore, the Skew-T plot for September 2nd is approximately around that time I took this picture. The horizontal line on the left side is pressure and height. The temperature line is blue and slopes up and to the right side. The curved blue line is the moist adiabat that slopes up and to the left. The green line is dry adiadat and slopes up and up to left side. The purple line is the saturation mixing ratio. There are two black lines. The right line is the environmental temperature profile. The left line is the dewpoint profile. The light black dashed line is air parcel temperature.

According to the figure 2, an air parcel lifted from the surface will first follow the dry adiabat. The temperature of the air parcel reaches the dewpoint temperature around approximately 4000 meters (12000 feet), that is the lifting condensation level (LCL) . At this level, the moist air could be condense to form clouds, so that the altocumulus clouds start to develop around 4000 meter (1200 feet). The thickness of the cloud extends up to around 7620 meters, where the dew point temperature profile and environmental temperature profile become close, increasing the possibility of local cloud formation. In addition, between 4000 and 7620 meters convection will occur because the temperature of an air parcel lifted from the surface is higher than the environmental temperature. Therefore there is instability in this level. Therefore, the altocumulus clouds that often form before a cold front is lifted by the unstable atmosphere.



My image of the cloud assignment of flow visualization illustrates the beautiful shot of the altocumulus on camera. The altocumulus clouds are very interesting and look stunning especially during the sunset. I really enjoy a good shooting and observing the movement of the clouds in the sky even though I had to wait a long time. And also I am happy with this final image. Overall, I think I got a better appreciation of the clouds in the sky and more experience in observing the phenomena of the clouds above the Earth.

Camera information

Mark: Canon

Model: Canon EOS DIGITAL REBEL XTI

Lens: Sigma 18-200mm with OS

Shutter speed: 1/60 sec

F-Stop: f/13.0

ISO: 400

Focal length: 31.0mm

Flash: No

References:

1 http://en.wikipedia.org/wiki/Cloud

2 http://en.wikipedia.org/wiki/Altocumulus

3 http://weather.uwyo.edu/upperair/seasia.html

4 http://weather.unisys.com/upper_air/skew/skew_KDNR.html